I CLAIM:

1. An assay device, comprising an array having both a planar surface and a configuration of reaction loci thereon, with each of said loci consisting essentially of at least one peptide or protein at least substantially suspended or dissolved in a hydrophilic carrier for said peptide or protein.

2. The assay device of claim 1, wherein said planar surface further comprises a nonporous chip or slide.

3. The assay device of claim 1, wherein said nonporous chip or slide includes a component selected from the group consisting of silicon; glass; silica; quartz; polystyrene and polyalkylene polymer.

4. The assay device of claim 1, wherein said configuration of reaction loci is that of a rectangular grid.

5. The assay device of claim 1, wherein said hydrophilic carrier is selected from the group consisting of saccharides, aklylene diols and alkylene polyols and said reaction loci measure between about 10 and 250 micrometers.

6. The assay device of claim 1, wherein said hydrophilic carrier is selected from the group consisting of dextranl; pluronic acid; carbohydrates of the pentose; ribose or hexose families; polysaccharides; polyethylene glycol polymer; 1,2-ethanediol; 2,3-butanediol and 1,2,3-propanetriol (glycerol), and said reaction loci measure between about 50 and 100 micrometers.

7. The assay device of claim 1, wherein said reaction loci further comprises enzyme reaction components selected from the group consisting of cofactors; inhibitors; antibodies; activators and buffer elements.

8. The assay device of claim 1, wherein said reaction loci includes a biological molecule or fraction selected from the group consisting of proteins; peptides; nucleic acids; enzymes; antibodies; lipids; cell lysates and vesicles.

9. The assay device of claim 1, wherein said loci further comprises fluorogenic substrates, chromogenic substrates or other reporter substrates.

10. An assay system, comprising:

a set of operating instructions resident in computer software;

a set of computer-controlled dot applicators;

a computer-controlled device for sample aerosol generation;

a computer-controlled xy positioner;

a computer and operating software; and

a chamber for control of biological samples,

wherein dot applicators create reaction spots to which aerosolized sample droplets are applied for computer-enhanced assay of any reaction between the sample droplets and the dot constituents.

11. The assay system of claim 10, wherein said operating instructions send signals, via serial or parallel port, to start, to stop, to establish operating set points and to

control the subcomponents of the device, whereby one or more subcomponents may have an internal or external standing controller or driver.

12. The subcomponents of claim 11, further comprising multiple positive displacement microsyringe pumps; aerosol generating devices such as pressure nozzles, ultrasonic nozzles, ink-jet printheads, position-actuated ink-jet printheads, surface-actuated ink-jet printheads, fluid-contacting or fluid-noncontacting ultrasound transducers; gas flow meter/controller; xy positioner system and exhaust/filtration fan.

13. The assay system of claim 10, wherein said microsyringes hold 1.0 microliters to 1000 μL of biological sample.

14. The assay system of claim 10, wherein said microsyringes deliver samples at a constant flow rate.

15. The assay system of claim 10, wherein said device for aerosol generation is an ultrasonic nebulizer.

16. The method for assaying a biological sample using a peptide or protein chip according to claim 1, comprising:

a) selecting a planar surface;

b) selecting a hydrophilic carrier and arraying a plurality of substrates in discrete reaction loci within aliquots of said hydrophilic carrier on said planar surface;

c) applying an aerosolized or misted sample having a sample droplet size between about 5 and 15 micrometers to the array formed in step (b); and

d) detecting any reaction between the sample and the plurality of substrates.

17. A method for assaying a biological sample using a peptide or protein chip according to claim 1, comprising applying an aerosolized or misted sample onto said configuration of reaction loci and detecting any reaction between any constituents of the sample and said peptide or protein contained within said configuration of reaction loci.

18. A method for assaying a biological sample using a peptide or protein chip according to claim 1, comprising applying an aerosolized or misted sample onto said configuration of reaction loci using an ultrasonic nebulizer and detecting any reaction between any constituents of the sample and said peptide or protein contained within said configuration of reaction loci.